

1. On a Skull of the Chelonian Genus *Lytoloma*.

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(Plates VI. & VII.)

In the year 1849 Sir Richard Owen, in his 'Monograph of the Fossil Reptilia of the London Clay,' Part I. Chelonia, published by the Palæontographical Society, described and figured (p. 27, pl. xi.) the imperfect skull of a large Marine Turtle from the Lower Eocene London Clay of Harwich, then in the possession of the late Prof. Thomas Bell, under the name of *Chelone crassicostata*. That species, it may be observed, was founded on the evidence of the shell, and it will be unnecessary on this occasion to enter on the question as to whether the specific association of the skull and shell is or is not correct.

In that plate the specimen is figured of two thirds the natural size ; one view showing the frontal aspect of the cranium, a second the right side, and the third the inferior aspect of the mandible, which is retained in its natural position. When the specimen was figured only the frontal aspect of the skull and the inferior and part of the lateral surfaces of the mandible were exposed, the whole of the base and occipital region of the cranium being concealed by the hard rock of the septarian nodule in which the specimen had been embedded. Moreover, on the frontal aspect of the cranium nearly all the outer shell of bone is wanting, the contour being mainly indicated by a cast of the inner surface of the cranial bones.

In the year 1863 this specimen was purchased, together with the remainder of Prof. Bell's collection from the London Clay, by the British Museum. There it has remained in its original condition until the beginning of the present year, when, with the permission of Dr. Woodward, the Keeper of the Geological Department, I put it into the skilled hands of Mr. R. Hall, assistant mason in that Department, by whom the skull of *Miolania* recently described by Sir Richard Owen in the 'Philosophical Transactions' was so skilfully developed. An equally successful result has rewarded his patience and skill in the present instance, and by carefully chiselling away the extremely hard matrix from the base of the specimen, the whole of the palatal and occipital aspects of the cranium, with the exception of that portion concealed by the mandible, is revealed in as perfect a condition as in any recent skull. Indeed, I am unacquainted with any other specimen of reptilian remains from the London Clay in which the bones are so perfectly preserved, and have such a sharp and fresh appearance.

Since this skull indicates a genus of Turtles totally distinct from all existing types, the only cranial evidence of which is presented to us, so far as English examples are concerned, by the present specimen, and another skull preserved in the Woodwardian Museum at Cam-

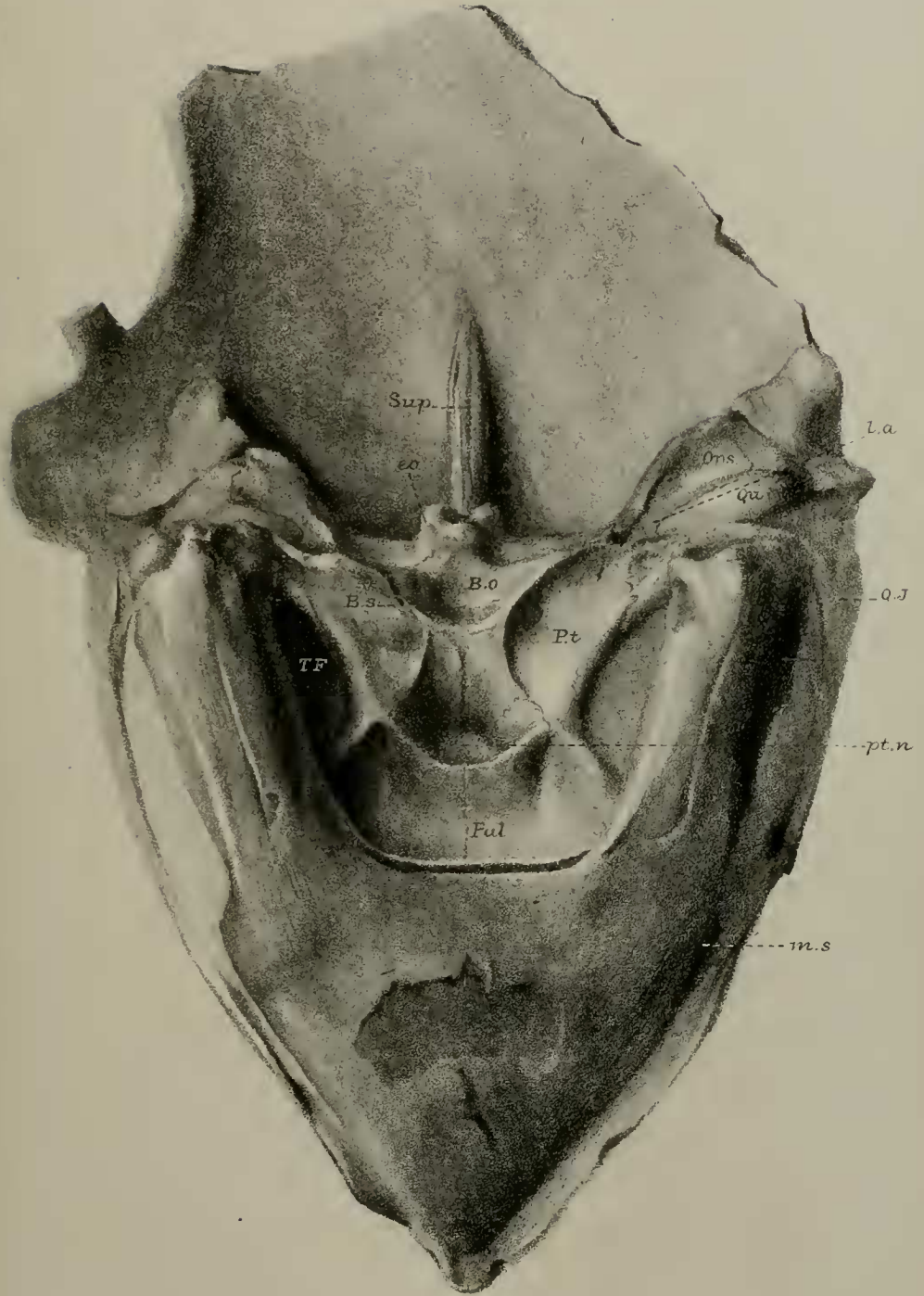
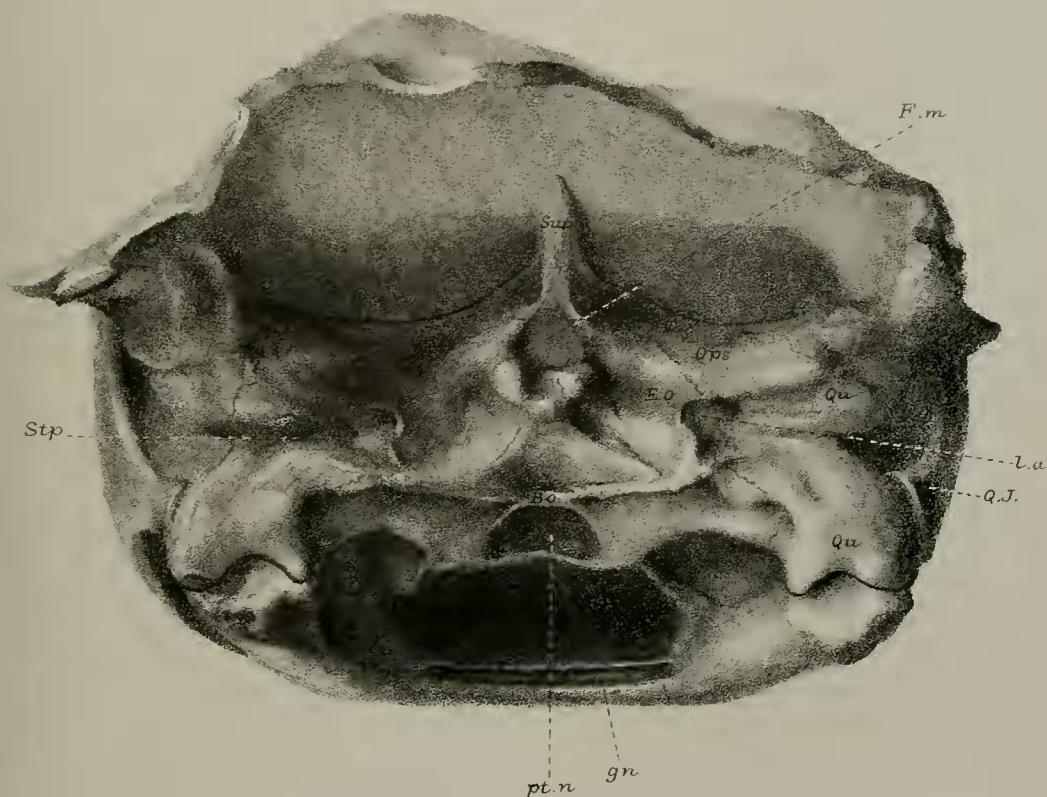




Fig. 2.



Fig 1





bridge, and figured by Sir Richard Owen in plate ix. of the memoir cited, under the name of *Chelone planimentum*, the description of the newly revealed palatal surface appears worthy of a place in the Society's 'Proceedings.' It is not, indeed, that the chief features of this surface have been hitherto unknown, for they have been described by M. Louis Dollo, of the Royal Museum of Natural History of Brussels, upon the evidence of specimens obtained from the Lower Eocene of Belgium, which are probably specifically identical either with the present form or with the one described as *Chelone planimentum*. Hitherto, however, M. Dollo has given no figure of the cranium, and I doubt whether any of the Belgian examples can be as beautifully preserved as the present one.

It has long been seen that the Chelonians from the London Clay described by Sir Richard Owen under the general term *Chelone* included many forms which could only be retained in that genus by employing that term in a much wider sense than that in which it is understood by students of recent herpetology. And from the year 1867 onwards a number of generic terms have been proposed for these and allied Chelonians from other deposits, which has resulted in an unusually complex synonymy. The chief features of this synonymy it is necessary to notice in some detail before proceeding to the consideration of the specimen before us.

In the year 1870, Prof. E. D. Cope, of Philadelphia, published his well-known "Synopsis of the Extinct Batrachia, Reptilia, and Aves of North America"¹, containing descriptions of the remains of Eocene Chelonians allied to the present form, which were arranged under several generic names, of which some had been first published at earlier dates. The names which it will be necessary to mention are—*Osteopygis*, dating from 1868², which was based on the evidence of the shell; *Euclastes*, dating from the preceding year³, and founded on the cranium; *Lytoloma* (1870), based on the evidence of the mandible; and *Puppigerus* (1870), which was applied to several of the Chelonians from the London Clay described by Sir Richard Owen, *Chelone planimentum* not, however, being among the number. In the following year Prof. H. G. Seeley⁴ proposed to distinguish the last-named species under the generic name of *Glossochelys*. Thus matters stood till the year 1886, when M. Dollo⁵ described some Chelonian remains from the Lower Eocene of Belgium, which he regarded as closely allied to *Chelone crassicostata* and *C. planimentum*, and proposed to refer, together with these and some other species, to a new genus under the name of *Pachyrhynchus*. That name, however, as was pointed out in a joint paper by Mr. G. A. Boulenger and the present writer⁶, was preoccupied; and in the following year its author⁷ proposed to

¹ Trans. Amer. Phil. Soc. vol. xiv. pt. i. (1870).

² Proc. Ac. Nat. Sci. Philad. 1868, p. 147.

³ *Ibid.* 1867, p. 39.

⁴ Ann. Mag. Nat. Hist. ser. 5, vol. viii. p. 227 (1871).

⁵ Bull. Mus. R. Hist. Nat. Belg. vol. iv. p. 130 (1886).

⁶ Geological Magazine, dec. 3, vol. iv. p. 270 (1887).

⁷ *Ibid.* vol. iv. p. 393 (1887).

replace it by *Erquelinnesia*. A year later (1887), M. Dollo¹, having had his attention directed to the circumstance that the name *Glossochelys* had been previously applied to one of the forms which were included in his *Erquelinnesia*, and also to the American types described by Prof. Cope, came to the conclusion that *Euclastes*, *Lytoloma*, some of the forms included in *Puppigerus*, *Glossochelys*, and *Erquelinnesia*, all belong to one and the same genus. It was at the same time considered that the earlier name *Osteopygis* might also indicate the same form, but since the skull was unknown its adoption seemed inadvisable; and it was accordingly proposed that the term *Euclastes*, as being the earliest of those based on the evidence of the skull, should be the one to be employed in this sense. Unfortunately, however, this arrangement could not be accepted, since, as the present writer has pointed out in a communication recently made to the Geological Society, the name *Euclastes* is pre-occupied. Accordingly, in that communication it was suggested, assuming M. Dollo to be correct in his identification of *Lytoloma* with *Erquelinnesia* = *Glossochelys*, that the former name, as being the second earliest of those based on parts of the skull, should be adopted.

In the same communication it was also pointed out that the so-called *Chelone longiceps*, which it seemed incumbent to take as the type of the genus *Puppigerus*, was closely allied to the Bracklesham Middle Eocene species originally described as *Chelone trigoniceps*, and that, although the latter differed somewhat in the form of the mandibular symphysis from typical forms of *Lytoloma*, yet these two species must be classed in the latter genus, as had been proposed by M. Dollo, at the time he employed the name *Pachyrhynchus* in the same sense.

Having now cleared up this intricate web of synonymy, attention may be directed to the features in which *Lytoloma* differs from existing *Chelonidæ*, and the opinions which have been held as to its affinities.

In describing the *Chelonidæ* of the London Clay, Sir Richard Owen included in the term *Chelone* not only the Edible and the Hawksbill Turtles, but also the Loggerhead, which is now generally regarded as entitled to generic distinction, and forms the type of the genus *Thalassochelys*, that genus typically differing from *Chelone* in the absence of ridges on the palate and mandibular symphysis², in the greater relative length of the latter, the lower alveolar walls of the palate and symphysis, and in the tendency to an earlier obliteration of the vacuities in the plastron, as well as in certain other skeletal features which need not be mentioned here. It should be observed, however, that all the features in which this genus differs from *Chelone* are those of less specialization.

In his original description Sir Richard Owen pointed out that the specimen under consideration was closely allied in structure to the skull of the so-called *Chelone planimentum*. And it was shown that

¹ *Ibid.* vol. v. p. 261 (1888), and Bull. Soc. Géol. Nord, vol. xv. p. 114 (1889).

² These ridges are present in the Mexican Loggerhead.